

REMARKS

The Applicant has now had an opportunity to carefully consider the comments set forth in the Office Action that was mailed September 19, 2007. All of the rejections are respectfully traversed. Amendment, reexamination and reconsideration of the application are respectfully requested.

The Office Action

In the Office Action that was mailed September 19, 2007:

claims 1, 6, 7, 10 and 26-29 were objected to for allegedly including informalities;

claims 1, 4-6, 12-14, 24-28, 31 and 32 were rejected under 35 USC §102(e) as being anticipated by U.S. Patent Application Publication No. 2003/0081607 by Kavanagh ("Kavanagh");

claims 2, 3 and 30 were rejected under 35 USC §103(a) as being unpatentable over Kavanagh in view of U.S. Patent No. 7,247,678 to O'Neill et al. ("O'Neill");

claims 7, 10 and 15-21 were rejected under 35 USC 103(a) as being unpatentable over Kavanagh in view of U.S. Patent No. 7,023,825 by Haumont et al. ("Haumont");

claims 8, 9, 22 and 23 were rejected under 35 USC 103(a) as being unpatentable over Kavanagh in view of Haumont and O'Neill; and

claims 11 and 29 were rejected under 35 USC 103(a) as being unpatentable over Kavanagh in view of U.S. Patent No. 7,215,955 to Forssell ("Forssell").

The Present Application

By way of brief review, the present application is directed toward systems and methods that improve communications network efficiency by building and maintaining path integrity tables in nodes of the network. The tables include path integrity information for paths associated with the nodes. The path is defined by a source address, a destination address, and a port or version number. Once a node is made aware of a path, either by handling network message traffic associated with the path or through manual entry, the node maintains path status information by extracting or inferring the status information from normal network message traffic.

Where normal network message traffic is absent, nodes may transmit Echo Request messages and determine or infer network status information based on information included in Echo Response messages or based on the lack thereof. Information related to paths that are disabled for longer than a disabled path duration limit is deleted from the tables. A Gratuitous GTP Echo Response message can notify other nodes of an administrative state change in a node (Abstract).

The Cited Documents

In stark contrast, the primary reference of the Office Action to Kavanagh is completely unrelated to the building and maintenance of path integrity information at nodes of a network. Instead, Kavanagh is related to a method of filtering data packets in General Packet Radio Service (GPRS) Tunneling Protocol (GTP) signaling messages (Abstract). The GTP filter inspects all GTP packets and performs specific filtering rules based on source and destination addresses, the message type and the GTP version number of the GTP packet in the GTP header. Allegedly, this limits the effect of denial of service attacks, malicious attacks, bandwidth soaked attacks, tunnel highjacking and accessibility from other PLMN networks (paragraph 34).

While embodiments of the present invention are described in terms of the General Packet Radio Service (GPRS) Tunneling Protocol and therefore shares many technical terms in common with the discussion provided by Kavanagh, Kavanagh addresses a different issue and does not disclose or suggest that nodes of a network to build or include path integrity protocol tables or to take advantage of path integrity information stored locally in a node to improve network efficiency.

The Office Action appears to draw an analogy between the path integrity protocol tables or databases of the present application and a dropped packet or past packet log referred to by Kavanagh. However, Kavanagh does not disclose what information is included in the log referred to by the Office Action. Moreover, Kavanagh does not disclose or suggest a use for the logged information.

The Applicant has found 57 occurrences of a form of the word -- log -- in Kavanagh. The last step depicted in each of Fig. 5-10 and 12-17 reads "log all packets that have been dropped or passed through the filter". Similar sentiments are expressed 50 times throughout the specification. However, Kavanagh does not indicate what information is logged or how that information might be used.

It is respectfully submitted that any motivation to interpret this reference to logging dropped or passed packets as storing the operational state of a path in a path integrity table in association with a path definition and a time stamp related to a time a GTP message was received, as recited, for example, in **claim 1** of the present application, could only be gleaned from information in the present application. Accordingly, such an interpretation is based on impermissible hindsight reasoning.

The first secondary reference to O'Neill allegedly discloses an autonomous system which performs routing for both mobile hosts, for which routing within the autonomous system is altered as a result of mobility of the mobile, and fixed, that is to say "stationary," hosts, for which no such routing alterations occur (column 4, lines 46-50). O'Neill indicates that an interior gateway protocol or single IP routing protocol used in the autonomous system of O'Neill, or in an embodiment thereof, is a modified version of the "Temporarily-Ordered Routing Algorithm (TORA) routing protocol, which was described in 'A Highly Adaptive Distributed Routing Algorithm for Mobile Wireless Networks' by Vincent D. Park and M. Scott Corson in the proceedings of Info Com '97, April 7-11, Kobe, Japan, and other documents (column 5, lines 40-51). Allegedly, the TORA protocol can be separated into three basic functions: creating routes, maintaining routes, and erasing routes (column 6, lines 20-22).

However, it is respectfully submitted that O'Neill does disclose or suggest the creation and maintenance of path integrity protocol tables as disclosed and claimed in the present application.

Haumont allegedly discloses a method for transmitting data packets in multiple data flows to and from a mobile station in a mobile communications system (Abstract). The Office Action cites column 3, lines 22-52 of Haumont against certain of the claims of the present application. In this regard, it is noted that column 3, lines 31-33 indicate that in the idle state the MS cannot be reached from the GPRS network, and no dynamic information on the current state or location of the MS is maintained in the network.

Forsell allegedly discloses a method and system for restoring a subscriber context in a network element of a mobile communication network wherein a new subscriber context which has been updated after the latest restart is indicated by transmitting the corresponding restart information to the network element (Abstract). Forsell mentions a restart counter value which is transmitted with a context

signaling message. However, the cited portion of Forssell does not disclose or suggest storing the restart counter value in association with the path definition in a path integrity table or in a path integrity protocol table.

The Claim Objections Are Overcome

Claims 1, 6, 7, 10 and 26-29 were objected to for including alleged informalities.

With regard to **claim 1**, the Office Action questions the appropriateness of the recitation of "a first node" in line 5 due to the recitation of "a first node" in line 3. However, in line 3, the recitation is of a -- a first node IP address --. Accordingly, it is respectfully submitted that the recitation in line 3 does not provide proper antecedence for a recitation of the node itself. Therefore, it is respectfully submitted that the introduction of "a first node" in line 5 is appropriate and withdrawal of the objection to **claim 1** with regard to "a first node" is respectfully requested.

Similar arguments are submitted with regard to the alleged problem related to recitation of "a second node" also in line 5. The earlier recitation is also in regard to an IP address. Accordingly, the introduction of "a second node" in line 5 is appropriate.

With regard to **claims 6 and 7**, the Office Action objects to the use of the phrase "an operational state of the path" because of the use of the phrase "an operational state" in line 10 of **claim 1**. However, **claims 6 and 7** have been amended and now refer to "an updated operational state." The assistance of the Examiner in identifying this problem in antecedents is noted with appreciation. Withdrawal of the objections to **claim 6 and 7** is respectfully requested.

With regard to **claim 10**, the Office Action objects to the recitation of "a GTP Echo Response message because of the recitation of "a GTP Echo Request message" in **claim 4**. However, it is respectfully submitted that the recitations are appropriate and correct. Wherein **claim 4** recites the transmission of a request, **claim 10** includes recitation regarding a response to the request.

Accordingly, withdrawal of the objection to **claim 10** is respectfully requested.

With regard to **claims 26-29**, the Office Action objects to the phrase "a path integrity protocol table" because of the recitation of "a path integrity protocol table" in **claim 24**. The assistance of the Examiner in identifying this error in antecedence is noted with appreciation. **Claims 26-29** have been amended as suggested by the

Office Action to recite "the path integrity protocol table". Accordingly, withdrawal of the objection to **claims 26-29** is respectfully requested.

The Claims Are Not Anticipated

Claims 1, 4-6, 12-14, 24-28, 31 and 32 were rejected under 35 USC §102(e) as being anticipated by Kavanagh.

However, Kavanagh is related to filtering packets as a defense against denial of service attacks (e.g., paragraphs 11 and 34) and is clearly unconcerned with generating and maintaining local caches of information regarding the operational state of paths throughout a network. Accordingly, Kavanagh is clearly unconcerned with and does not disclose a method for providing improved GTP path integrity assurance that includes storing the operational state of a path in a path integrity table or path integrity protocol table and Kavanagh does not disclose or suggest doing so. It is respectfully submitted that assertions of the Office Action to the contrary represent **clear errors of fact**.

For example, with regard to **claim 1**, the Office Action cites paragraph 36 in support of the assertion that Kavanagh discloses an operational state of a path based on a first received message and paragraph 55 in support of the assertion that Kavanagh discloses storing the operational state of the path in a path integrity table in association with a path definition and a time stamp related to a time the first GTP message was received.

However, paragraph 36 explains that a path management protocol may be used for a denial of service or distributed denial of service attack. Accordingly, the system of Kavanagh "inspects this type of message" in an apparent effort to defend against such attacks (e.g., last half of paragraph 36). Paragraph 36 also indicates that the path management protocol checks the state of peer GSN nodes for which a PDP context **has been established** and that path management is performed whenever two GSN nodes are in communication **in an active PDP context**, i.e., a GTP tunnel **is established** between the two GSN nodes. In this regard, it is noted that Kavanagh does not disclose or suggest that the operational state of paths is determined. Furthermore, even if Kavanagh could be construed as disclosing determining an operational state of a path for which an active PDP context is established, Kavanagh does not disclose or suggest determining an operational state of paths for which PDP contexts are no longer active. That is, Kavanagh does

not suggest storing or maintaining that information for use after the PDP contexts have been torn down. Accordingly, it is respectfully submitted that since Kavanagh does not disclose this maintenance activity, Kavanagh cannot be construed as disclosing the method for providing improved GTP path integrity assurance recited in **claim 1**.

The reference to paragraph 55 appears to be a reference to the single sentence that indicates that "all packets that have been dropped or have passed through the GTP filter may be logged at step 54". However, nothing in this sentence discloses or suggests that an operational state of a path is stored in a path integrity table. Moreover, this sentence does not disclose or suggest that the operational state of the path is stored in association with a path definition and a time stamp related to a time a first GTP message was received. It is respectfully submitted that the word "log" or "logged" occurs 57 times in Kavanagh. Including one occurrence each in each of Figs. 5-10 and 12-17 and 44 occurrences in the text of the specification including paragraphs 44-45, 58, 61, 62, 64, 65, 67-70, 73, 74, 76, 77, 79, 82, 85, 86, 89, 90, 92, 93, 95, 96, 98, 99 and claim 16. However, the Applicant has been unable to find, and it is respectfully submitted Kavanagh does not include, any indication of what information is logged or how the logged information might be used. Accordingly, it is respectfully submitted that Kavanagh does not disclose or suggest storing the operational state of a path in a path integrity table in association with a path definition and a time stamp related to the time the first GTP message was received.

Further in this regard, it is respectfully submitted that discussion of a log indicating that packets were passed or filtered is not fairly construed to be disclosure of a path integrity table or path integrity protocol table as the phrase is used in the present application. Moreover, it is respectfully submitted that the only motivation to interpret the log of Kavanagh as a path integrity table is information gleaned from the present application. Accordingly, it is respectfully submitted that the rejection of **claim 1** is based on impermissible hindsight reasoning.

For at least the foregoing reasons, **claim 1**, as well as **claims 2-14**, which depend therefrom, is not anticipated by Kavanagh.

With regard to **claim 4**, the Office Action cites paragraphs 53 and 55. However, even if paragraph 53 discusses the use of Echo Request and Echo Response messages, the cited paragraphs do not disclose or suggest determining a

difference between a value of a time stamp (i.e., the time stamp associated with an entry stored in a path integrity protocol table as recited in claim 1) and transmitting a GTP Echo Request message if the difference between the value of the time stamp and the current time is greater than a predetermined refresh time. Indeed, it is respectfully submitted that paragraphs 53 and 55 are silent with regard to time stamps or comparing time stamps to a current time.

For at least the foregoing additional reasons, **claim 4**, as well as **claims 7-10**, which depend therefrom, is not anticipated by Kavanagh.

With regard to the assertion that Kavanagh discloses all eight elements of **claim 6**, the Office Action points to paragraph 64 without further comment.

However, paragraph 64 discusses Fig. 7, which is a flowchart illustrating the analysis and filtering performed on update PDP context messages in the preferred embodiment of the system or methods of Kavanagh (paragraph 22). Kavanagh is concerned with filtering packets and is not concerned with determining an operational state of a path. Accordingly, it is respectfully submitted that paragraph 64 does not disclose or suggest determining an operational state of the path based on a second received message as recited in **claim 6**. Moreover, paragraph 64 does not disclose or suggest determining an updated operational state of a path for which an operational state has previously been determined between a first and second node based on a second received message, as recited in **claim 6**.

Even though paragraph 64 includes the word "update" (in reference to update PDP context messages), paragraph 64 does not disclose or suggest updating the operational state entry associated with the path definition in the path integrity table as was recited in **claim 6**. Furthermore, paragraph 64 does not disclose or suggest updating the operational state entry associated with the path definition in the path integrity protocol table according to the determined updated operational state of the path as is now recited in **claim 6**.

Further in this regard, paragraph 64 does not disclose or suggest updating the time stamp with a value related to a time the second GTP message was received as is recited in **claim 6**.

For at least the foregoing additional reasons, **claim 6** is not anticipated by Kavanagh.

In support of the assertion that Kavanagh discloses the subject matter of **claim 12**, the Office Action merely cites paragraph 36 without further comment.

However, paragraph 36 does not even mention an administrative state of a path. Furthermore, paragraph 36 does not mention a path integrity table. Moreover, paragraph 36 does not disclose or suggest storing an administrative state of a path in association with a path definition in a path integrity protocol table as recited in **claim 12**. Clarification of the assertion of the Office Action is respectfully requested.

For at least the foregoing additional reasons, **claim 12** is not anticipated by Kavanagh.

With regard to **claim 13**, the Office Action again cites paragraph 36 without further comment. However, it is respectfully submitted that Kavanagh does not disclose or suggest receiving administrative state information regarding a path and storing the administrative state information in an administrative state entry in a path integrity protocol table in association with the path definition as is recited in **claim 13**. Clarification of the position of the Office is respectfully requested.

For at least the foregoing additional reasons, **claim 13** is not anticipated by Kavanagh.

In support of the assertion that Kavanagh discloses the subject matter of **claim 14**, the Office Action merely cites paragraph 58 without any further comment. However, **claim 14** recites: consulting the path integrity table to determine the operational state of the path before attempting to set up a GTP tunnel on the path and choosing an alternate route for the GTP tunnel if the path integrity table indicates that the path is disabled or unknown.

In stark contrast, paragraph 58 is directed toward Fig. 6 of Kavanagh. Fig. 6 of Kavanagh is a flowchart illustrating the analysis and filtering performed on Create PDP Context messages in the preferred embodiment of the systems or methods of Kavanagh (see paragraph 21 and the first sentence of paragraph 58). Paragraph 58 does not disclose or suggest consulting a table. Furthermore, paragraph 58 does not disclose or suggest consulting a path integrity table or a path integrity protocol table. Moreover, paragraph 58 does not disclose or suggest choosing an alternate route for a GTP tunnel if the path integrity protocol table indicates that the path is disabled or unknown.

Instead, paragraph 58 indicates that GTP packets are first checked against the correct source and destination and mask addresses. Next, the packets are checked against the expected UDP/TCP port numbers, 3386 and 2123. The packet is then inspected at the GTP level, layer 5. At layer 5, the version number is

checked in the GTP header to see if the version is supported, and if not, the packet is dropped and logged. Next, the message type is checked to determine whether that message type is permitted from the subject GSN node, and is logged accordingly. Additionally, the minimum to maximum message length is checked in accordance with the message type. It is respectfully submitted that source and destination mask addresses are not fairly construed as a path integrity protocol table. Expected port numbers are not fairly construed as a path integrity protocol table. GTP versions are not fairly construed as a path integrity protocol table. It is respectfully submitted that the check of source and destination and mask addresses of paragraph 58 is a check against addresses known to be assigned addresses in the network and is not fairly construed as a check against addresses currently known to be functional and available. The check of Kavanagh is to identify maliciously transmitted packets associated with denial of service attacks and is not a check to select a path known to be operational for transmitting the packet.

Accordingly, paragraph 58 does not disclose or suggest choosing an alternate route for the GTP tunnel if the path integrity protocol table indicates that the path is disabled or in an unknown state.

For at least the foregoing additional reasons, **claim 14** is not anticipated by Kavanagh.

With regard to independent **claim 24**, the Office Action cites paragraphs 54 and 55 of Kavanagh without further comment.

However, paragraph 54 addresses Fig. 5 which is a flowchart illustrating the analysis and filtering performed on Echo Request and Echo Response messages in the preferred embodiment of the systems and methods of Kavanagh.

Paragraph 55 indicates that, as shown at step 52, GTP packets that do not meet the filtering criteria are dropped, while those meeting the criteria are passed through the filter. At step 53, line rate limit is imposed based on the message type on a peer-to-peer basis. All packets that have been dropped or have passed through the GTP filter may be logged at step 54.

It is respectfully submitted that nothing in paragraph 55 discloses or suggests a path integrity protocol module that is operative to build a path integrity protocol table by extracting path integrity information from network message traffic associated with the node and record the extracted information in the path integrity protocol table, update the information recorded in the table by extracting updated path integrity

information from additional network message traffic associated with the node and recording the extracted updated information in the table. Furthermore, nothing in paragraph 55 discloses or suggests a path integrity protocol module that monitors the age of recorded information stored in the table and updates old information in the table by directing the GTP Echo Request/Response processor to transmit GTP Echo Requests over paths associated with the old table information and to provide information to the path integrity protocol module regarding the reception or lack of reception of GTP Echo Response messages associated with the GTP Echo Requests. Furthermore, nothing in paragraph 55 discloses or suggests a path integrity protocol module that is further operative to replace the old recorded information with new information based on the information provided to the path integrity protocol module by the GTP Echo Request/Response processor. Clarification of the position of the Office is respectfully requested.

For at least the foregoing reasons, **claim 24**, as well as **claims 25-32**, which depend therefrom, is not anticipated by Kavanagh.

With regard to **claim 25**, the Office Action cites paragraph 13 without further comment. However, while paragraph 13 mentions service nodes, paragraph 13 does not disclose or suggest that main network node functional blocks of a node such as described in **claim 24** are radio node controller main functional blocks, serving GPRS support node main functional blocks or gateway GPRS support node main functional blocks. Indeed, paragraph 13 does not even mention a radio node controller, serving GPRS support node or gateway GPRS support node. Accordingly, clarification of the position of the Office is respectfully requested.

For at least the foregoing additional reasons, **claim 25** is not anticipated by Kavanagh.

With regard to **claim 26**, the Office Action cites paragraph 48 of Kavanagh without further comment. However, paragraph 48 indicates that tunnel management messages are analyzed and that based on the information in the GTP header, accompanying IEs, and the GTP version number, selected GTP packets are blocked. As shown at 44, the GTP filter may select messages for analysis from a group that includes the GTP create PDP context, update PDP context, delete PDP context, create anonymous access (AA) PDP context, delete AA PDP context, error indication, PDU Notification, and PDU Notification reject messages. While paragraph 48 mentions some of the same messages recited in **claim 26**, paragraph

48 does not disclose or suggest that a path integrity protocol module builds a path integrity protocol table by extracting path integrity information from such messages. Clarification of the position of the Office is respectfully requested.

For at least the foregoing additional reasons, **claim 26** is not anticipated by Kavanagh.

With regard to **claim 27**, the Office Action cites paragraph 55. However, the only discussion in paragraph 55 of anything that could be remotely construed as discussion of building a table is the indication that all packets that have been dropped or have passed through the GTP filter may be logged at step 54. It is respectfully submitted that nothing in paragraph 55 indicates what information is logged. Accordingly, paragraph 55 cannot disclose the UMTS/GPRS network node of **claim 24** wherein the path integrity protocol module is further operative to build the path integrity protocol table by extracting path definition and path operational status information from the network message traffic associated with the node and record the extracted information in the path integrity protocol table, as recited in **claim 27**.

For at least the foregoing additional reasons, **claim 27** is not anticipated by Kavanagh.

With regard to **claim 28**, the Office Action cites paragraph 47.

However, even if paragraph 47 mentions port numbers and source and destination IP addresses, paragraph 47 does not disclose or suggest a protocol module operative to build a path integrity protocol table by extracting such information from network message traffic, as recited in **claim 28**. Moreover, **claim 28** has been amended to recite that the extracted information is recorded in the path integrity protocol table. It is respectfully submitted that paragraph 47 does not disclose recording such extracted information in a path integrity protocol table.

It is respectfully submitted that this amendment to **claim 28** is supported throughout the present application, including, the reference to building a path integrity protocol table included in **claim 28** itself. Furthermore, since **claim 28** as originally filed recited subject matter related to building the path integrity protocol table, the amendment to **claim 28** should not raise new issues and does not require a new search.

For at least the foregoing additional reasons, **claim 28** is not anticipated by Kavanagh.

With regard to **claim 31**, the Office Action cites paragraph 64 without further comment.

However, paragraph 64 discusses Fig. 7 which is a flowchart illustrating the analysis and filtering performed on update PDP context messages.

Paragraph 64 does not disclose or suggest a path integrity protocol module operative to accept manual path definition entries and include records associated with the manual path definition entries in a path integrity protocol table. Clarification of the position of the Office is respectfully requested.

For at least the foregoing additional reasons, **claim 31** is not anticipated by Kavanagh.

With regard to **claim 32**, the Office Action again cites paragraph 64 without further comment. However, paragraph 64 is related to filtering update PDP context messages and does not disclose or suggest a path integrity protocol module that is operative to accept manually entered administrative state information associated with a path definition record and update an administrative state entry in the path integrity protocol table associated with the path definition record according to the manually entered administrative state information. Clarification of the assertion of the Office Action is respectfully requested.

For at least the foregoing additional reasons, **claim 32** is not anticipated by Kavanagh.

The Claims Are Not Obvious

Claims 2, 3 and 30 were rejected under 35 USC §103(a) as being unpatentable over Kavanagh in view of O'Neill.

However, **claims 2 and 3** depend from **claim 1** and are patentably distinct and are not obvious for at least that reason. **Claim 30** depends from **claim 24** and is patentably distinct and is not obvious for at least that reason.

Additionally, even if the cited portions of column 6 of O'Neill indicate that the TORA protocol creates routes and erases routes and even if the cited portion of column 8 mentions allocating IP addresses to mobile hosts dynamically, for the duration of their access sessions, or over longer periods, i.e., without reallocation between sessions, it is respectfully submitted that this does not disclose or suggest the dynamic or static defining of paths as recited in **claims 2 and 3**, respectively, or storing the static path definition as a path entry in a path integrity protocol table as is

recited in **claim 2**.

For at least the foregoing additional reasons, **claims 2** and **3** are not anticipated and are not obvious in light of Kavanagh and O'Neill.

Claim 30 recites the UMTS/GPRS network node of **claim 24** wherein the path integrity protocol module is further operative to delete path information from the path integrity table when an operational status of the path associated with the path information has been -- disabled -- for longer than a path disabled duration limit. It is respectfully submitted that the discussion of recording a time a link fails does not disclose or suggest deleting path information from a path integrity table when an operational status of the path associated with the path information has been disabled for longer than a path disabled duration limit.

For at least the foregoing additional reasons, **claims 2, 3, and 30** are not anticipated and are not obvious in light of Kavanagh and O'Neill.

Claims 7, 10 and 15-21 were rejected under 35 USC §103(a) as being unpatentable over Kavanagh in view of Haumont.

With regard to **claim 15**, the Office Action asserts that Kavanagh discloses the bulk of the subject matter recited in **claim 15** and vaguely refers to paragraph 47 and Fig. 4 of Kavanagh in support of these assertions. However, it is respectfully submitted that Fig. 4 is a flowchart illustrating the overall method of filtering GTP packets in the preferred embodiment of the system and method of Kavanagh (first sentence, paragraph 47). It is respectfully submitted that none of the steps depicted in Fig. 4 or addressed in paragraph 47 disclose or suggest building a path integrity table or path integrity protocol table of records from information included in GTP messages, each record in the path integrity table including a path definition, an operational state entry and a time stamp, the path definition including at least a source IP address, a destination IP address and a port number. Clarification in this regard is respectfully requested.

For example, which element depicted in Fig. 4 or which sentence or group of sentences in paragraph 47 does the Office assert discloses or suggests this portion of the building element of **claim 15**. It is respectfully submitted that the mere discussion of source and destination IP addresses and port numbers does not disclose or suggest the building of a path integrity table or a path integrity protocol table.

Additionally, Fig. 4 and paragraph 47 do not disclose or suggest updating

records in the path integrity table when additional GTP messages associated with path definitions having records in the table are received based on information included in the additional messages, or when expected messages are not received, updating the records based on the lack of reception of the expected messages. Clarification in this regard is respectfully requested.

For example, which element of Fig. 4 and/or paragraph 47 does the Office assert discloses updating records in a path integrity table when additional GTP messages associated with the path definitions having records in the table are received? Which portions of Fig. 4 and/or paragraph 47 does the Office assert discloses updating records in the path integrity table when expected messages are not received based on the lack of reception of the expected messages?

Furthermore, it is respectfully submitted that paragraph 47 and Fig. 4 do not disclose or suggest making information in the path integrity table available to call processing and OAM subsystems of the GPRS network as is recited in **claim 15**. Clarification of the position of the Office in this regard is respectfully requested.

For example, which block depicted in Fig. 4 and which sentence or sentences of paragraph 47 does the Office allege discloses making information in a path integrity table or path integrity protocol table available to call processing and OAM subsystems of the GPRS network?

For at least the foregoing reasons, **claim 15**, as well as **claims 16-23**, which depend therefrom, are not anticipated and are not obvious in light of Kavanagh and Haumont.

With regard to **claim 17**, the Office Action asserts that paragraph 36, lines 1-3, of Kavanagh disclose the subject matter of **claim 17**. However, **claim 17** recites *intra alia*: transmitting a Gratuitous GTP Echo Response message. It is respectfully submitted that the term "Gratuitous GTP Echo Response message" is a term coined in the present application (e.g., see page 4, lines 1-16; page 12, lines 1-10; page 15, lines 13-26; page 16, line 38; page 20, lines 6-16; page 20, lines 5-16; and page 22, lines 5-23). Accordingly, Kavanagh cannot disclose or suggest transmitting a Gratuitous GTP Echo Response message.

Furthermore, the cited portion of Kavanagh simply indicates that "GTP has a path management protocol utilized to check the state of peer GSN nodes for which a PDP context has been established." It is respectfully submitted that nothing in the cited portion of paragraph 36 discloses or suggests receiving administrative state

information regarding the path, storing the administrative state information in an administrative state entry in the path integrity protocol table in association with the path definition and transmitting a Gratuitous GTP Echo Response message.

For at least the foregoing additional reasons, **claim 17** is not anticipated and is not obvious in light of Kavanagh and Haumont.

The Office Action asserts that Kavanagh discloses the subject matter of **claim 18** and cites paragraphs 53 and 55 in support of this assertion. However, paragraph 53 indicates that path management is used to check the status of a GSN node and/or an RNC peer which is currently participating in an active PDP context. Paragraph 55 indicates that the GTP filter permits an Echo Response message only when an Echo Request has first been received from the peer GSN node. It is respectfully submitted that paragraphs 53 and 55 do not disclose or suggest comparing values of the time stamp entries of records in the table to a current time to determine ages of records. It is respectfully submitted that paragraphs 53 and 55 do not disclose or suggest transmitting a GTP Echo Request to the destination IP address and port number associated with any record having an age greater than a desired record age limit, the GTP Echo Request including the source IP address associated with the record. Additionally, it is respectfully submitted that paragraphs 53 and 55 do not disclose or suggest updating the entries of any record based on a received GTP Echo Response associated with the GTP Echo Request or on a lack thereof. Clarification of the position of the Office is respectfully requested.

For at least the foregoing additional reasons, **claim 18** is not anticipated and is not obvious in light of Kavanagh and Haumont.

The Office Action asserts that Kavanagh discloses the subject matter of **claim 19**. In support of this assertion, the Office Action cites paragraphs 53 and 55.

However, it is respectfully submitted that paragraphs 53 and 55 do not disclose or suggest updating the operational state entry to -- Enabled -- and the time stamp entry to a time associated with the GTP Echo Response message as recited in **claim 19**. Clarification of the position of the Office is respectfully requested.

For at least the foregoing additional reason, **claim 19** is not anticipated and is not obvious in light of Kavanagh and Haumont.

The Office Action asserts that Kavanagh discloses the subject matter of **claim 20** and again cites paragraphs 53 and 55 in support of the assertion. However, paragraphs 53 and 55 do not disclose or suggest determining that a GTP Echo

Response message was not received, comparing a Retry Counter value to a retry limit, transmitting another GTP Echo Request message if the Retry Counter is less than the retry limit, incrementing the Retry Counter and updating the operational state entry to -- Unknown --, as recited in **claim 20**. Clarification of the position of the Office is respectfully requested.

For at least the foregoing additional reasons, **claim 20** is not anticipated and is not obvious in light of Kavanagh and Haumont.

The Office Action asserts that Kavanagh discloses the subject matter of **claim 21** and again cites paragraphs 53 and 55 in support of the assertion.

However, paragraphs 53 and 55 do not disclose or suggest determining that the GTP Echo Response message was not received, comparing a retry counter value to a retry limit, updating the operational state entry to -- Disabled -- if the retry counter value is equal to or greater than the retry limit, and updating the time stamp entry to a time associated with the updating of the operational state entry to -- Disabled --. Clarification of the position of the Office is respectfully requested.

For at least the foregoing additional reasons, **claim 21** is not anticipated and is not obvious in light of Kavanagh and Haumont.

The Office Action stipulates that Kavanagh does not disclose the subject matter of **claims 7** and **10** and a portion of the subject matter of **claim 15** and relies on Haumont in this regard.

However, the Office Action does not assert that Haumont discloses the subject matter of **claims 7, 10**, or the portion of the subject matter of **claim 15** that the Office Action stipulates is not disclosed by Kavanagh. Instead, the Office Action simply asserts that Haumont discloses a mobile communications system and method that transmits multiple data flows using different states for managing the mobile subscriber and directs the attention of the Applicant to column 3, lines 22-52. It is respectfully submitted that the mere disclosure of a mobile communications system and method that transmits multiple data flows using different states for managing the mobile subscriber does not disclose or suggest determining that a second node has not responded to a transmitted GTP Echo Request message, determining an updated operational state of the path to be -- Disabled -- based on the determination that the second node has not responded to the transmitted GTP Echo Request message, updating the operational state entry associated with the path definition in the path integrity table or path integrity protocol table to be -- Disabled -- and

updating the time stamp with a value related to the determination that the second node has not responded to the transmitted GTP Echo Request message, as recited in **claim 7**.

Additionally, it is respectfully submitted that discussion of a mobile communications system and method that transmits multiple data flows using different states for managing the mobile subscriber does not disclose or suggest determining that a GTP Echo Response was not received, updating the operational state of the path to be -- Unknown -- and transmitting a second GTP Echo Request message from the first node to the second node, using the port number and using the first node IP address as a source address and the second node IP address as the destination address, as recited in **claim 10**.

Additionally, discussion of a mobile communications system and method that transmits multiple data flows using different states for managing the mobile subscriber does not disclose or suggest the operational state entry in a path integrity protocol table has a value selected from -- Enabled --, -- Disabled -- and -- Unknown --, the time stamp entry having a value indicative of a time information in the record was last updated as recited in **claim 15**.

For at least the foregoing additional reason, **claim 15** is not anticipated and is not obvious in light of Kavanagh and Haumont. Furthermore, at column 3, lines 32-34, Haumont indicates that **no dynamic information** on the current state or location of the MS i.e., the MM context, **is maintained in the network**. Accordingly, it is respectfully submitted that Haumont does not disclose or suggest the subject matter of the present application wherein the state of communication paths **is maintained** in path integrity protocol tables included in network elements.

For at least the foregoing additional reasons, **claims 7, 10 and 15** are not anticipated and are not obvious in light of Kavanagh and Haumont.

Claims 8, 9, 22 and 23 were rejected under 35 USC §103(a) as being unpatentable over Kavanagh, Haumont and O'Neill.

The Office Action stipulates that Kavanagh and Haumont do not disclose the subject matter of **claims 8, 9, 22 and 23** and relies on O'Neill for this subject matter. In this regard, instead of addressing the subject matter of **claims 8, 9, 22, and 23**, the Office Action again cites portions of columns 6 and 8 of O'Neill and asserts that O'Neill discloses a method of controlling packet routing with three basic functions: creating routes, maintaining routes and erasing routes; the method includes the use

of a value that records the time of a link failure and the method also includes the capability to function over static and dynamic IP addresses.

However, **claim 8** depends from **claim 7**, which depends from **claim 4**, which depends from **claim 1** and is not anticipated and is not obvious for at least that reason. **Claim 9** depends from **claim 8**, which depends from **claim 7**, which depends from **claim 4**, which depends from **claim 1** and is not anticipated and not obvious for at least that reason. **Claim 22** depends from **claim 21** which depends from **18**, which depends from **claim 15** and is not anticipated and not obvious for at least that reason. **Claim 23** depends from **claim 22**, which depends from **claim 21**, which depends from **claim 18** and is not anticipated and is not obvious for at least that reason.

Additionally, **claims 9** and **23** recite comparing the value of the path disabled time stamp entry to a current time, thereby determining a path disabled duration and deleting the path definition and associated information from the path integrity protocol table if the path disabled duration is greater than a predefined path disabled time limit. It is respectfully submitted that O'Neill does not disclose, and the Office Action does not assert that O'Neill discloses, the subject matter of **claims 9** and **23**.

For at least the foregoing additional reasons, **claims 9** and **23** are not anticipated and are not obvious in light of Kavanagh, Haumont and O'Neill.

Claims 11 and **29** were rejected under 35 USC §103(a) as being unpatentable over Kavanagh in view of Forssell.

However, **claims 11** and **29** depend from **claims 1** and **24**, respectively, and are not anticipated and are not obvious for at least that reason.

Telephone Interview

In the interests of advancing this application to issue the Applicant(s) respectfully request that the Examiner telephone the undersigned to discuss the foregoing or any suggestions that the Examiner may have to place the case in condition for allowance.

CONCLUSION

Claims 1-32 remain in the application. Claims 1, 2, 6, 7, 9, 11, 12, 14, 15, 18, 22, 23, 26-30 have been amended to correct antecedence or for the sake of consistency. The amendments do not require a new search. For at least the foregoing reasons, the application is in condition for allowance. Accordingly, an early indication thereof is respectfully requested.

Respectfully submitted,

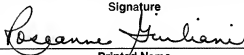
Fay Sharpe LLP


Joseph D. Dreher, Reg. No. 37,123
Thomas Tillander, Reg. No. 47,334
1100 Superior Avenue
Seventh Floor
Cleveland, Ohio 44114-2579
216-861-5582

January 22, 2008
Date

CERTIFICATE OF MAILING OR TRANSMISSION

Under 37 C.F.R. § 1.8, I certify that this Amendment is being
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☐ transmitted via facsimile in accordance with 37 C.F.R. § 1.8 on the date indicated below.
☒ transmitted to the USPTO by electronic transmission via EFS-Web on the date indicated below.

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Date January 22, 2008	Printed Name Roseanne Giuliani